



Hardy Fern Foundation Quarterly



Fall 2006

THE HARDY FERN FOUNDATION

P.O. Box 3797

Federal Way, WA 98063-3797

Web site: www.hardyferns.org

The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Satellite fern gardens are at the Stephen Austin Arboretum, Nacogdoches, Texas, Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, Sacramento, California, Coastal Maine Botanical Garden, Boothbay, Maine, Dallas Arboretum, Dallas, Texas, Denver Botanic Gardens, Denver, Colorado, Georgeson Botanical Garden, University of Alaska, Fairbanks, Alaska, Harry P. Leu Garden, Orlando, Florida, Inniswood Metro Gardens, Columbus, Ohio, New York Botanical Garden, Bronx, New York, and Strybing Arboretum, San Francisco, California.

The fern display gardens are at Bainbridge Island Library, Bainbridge Island, WA, Lakewold, Tacoma, Washington, Les Jardins de Metis, Quebec, Canada, Rotary Gardens, Janesville, WI, University of Northern Colorado, Greeley, Colorado, and Whitehall Historic Home and Garden, Louisville, KY.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

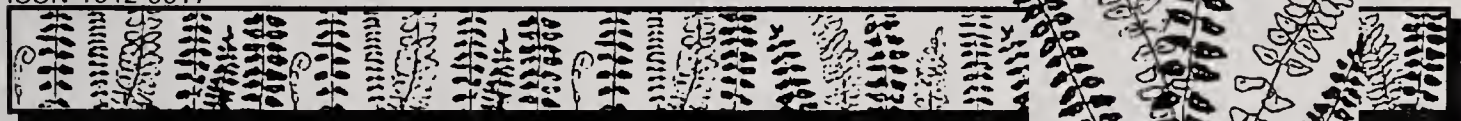
Cover Design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

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Volume 16 No. 4 Editor-Sue Olsen

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The Spore Exchange Needs You!

Please send your spores to our Spore Exchange Director:

Katie Burki
501 S. 54th St.
Tacoma, WA 98408

Fern Quarterly Fall 2006

President's Message

As autumn progresses I feel more and more that the time for a little rest and relaxation is not going to come anytime soon. A glance out the window and into the garden and I only see plants ready to be cut back and a recently delivered pile of mulch to tuck everything in for the season.

Fortunately, there are several very exciting projects that are moving forward for the Hardy Fern Foundation. The most exciting is the new stumpery fern garden we are creating in the Rhododendron Species Botanical Garden. The RSBG has graciously provided a beautiful site to build this unique display of ferns, timber, rhododendrons, and trees. This will be the first stumpery in a public garden on the west coast and we are looking forward to the installation. The first steps started in early September. The Foundation's two employees, Curator Michelle Bundy, and her assistant Jo Laskowski, and I marked 38 tree stumps ranging from two to five feet across from a nearby construction site. These huge stumps should be delivered to the RSBG any day now. We have received encouraging words on this project from HFF member Ralph Archer the creator of the Whitehall stumpery in Louisville, KY. The photos he has sent the board have been an inspiration for this project.

To help let our members know what progress we are making on the stumpery we are working on a new emailing that will send low resolution photos of the installation to keep you in touch with what is happening. If you do not think you are on our email list just send a note to Michelle at rsf@rhodygarden.org.

All members who ordered plants from our distribution program should have received their ferns in late September. I hope they arrived well and have all found a home in your gardens. This program is a great perk of membership and a wonderful way to get some uncommon ferns for your garden. We have also sent the new plants for the HFF display gardens located around the country. I would like to encourage members to go see these plantings and ask how the new plants are doing. For members who missed out on this year's distribution watch for the new list in next summer's Quarterly and order early!

For those fern enthusiasts thinking about travel plans for next year there is an exciting trip being planned. Inspired by his recent trip to Germany, board member-at-large, Naud Burnett, is working on a fern foray to Texas. The projected dates are for October 3rd –16th and will include a full look at the diverse native ferns of this great state as well as visiting several public and private gardens. See page 90 for further information on the trip.

Best wishes for a late frost and mild fall,

Richie Steffen

Web Resources

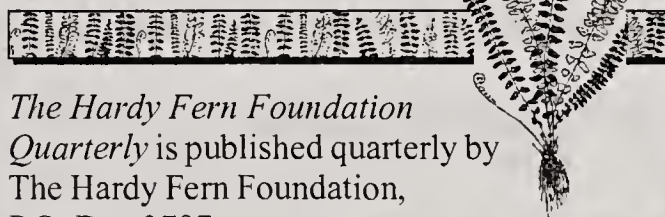
Michelle Bundy

The Hardy Fern Foundation is currently in the process of updating our website. We will have a new look and many exciting new features. Through this process we have researched a variety of sites and along the way, stumbled across some great fern information. This quarter's featured site is <http://www.ct-botanical-society.org/ferns/index.html>.

This site is put together by the Connecticut Botanical Society, who celebrated their 100th year in 2003. Here you will find 77 of the state's native ferns listed by common and botanical names. For each species there is a description including family, habitat, height, location of spores, stipe, growth pattern, and persistence. Along with this you will find two to five pictures of each fern. The photographs here are outstanding! They show the fern's habit, close ups of individual sterile and fertile fronds, and beautiful sporangia shots. Many of the pictures are taken by Janet Novak, who also maintains the site. Janet's photos have appeared in Horticulture magazine, Chicago Wilderness magazine, and in the new edition of Peterson's Field Guide to Ferns. One click on "next fern" easily moves you through the list. You can also click on "rare plant" and browse through many of the seldom seen ferns and other plants of the region. A handy feature this site offers is links to other ferns similar in appearance so you can quickly make a comparison. Just as useful are side by side frond comparisons of commonly confused species.

If you are heading out into the field, one of the CBS members has compiled a very comprehensive quick guide to the common ferns of New England. We found this to be a very attractive, useful and easily navigated site for the fern enthusiast. So, next time you are surfing the web, be sure to check it out.

THE HARDY FERN FOUNDATION QUARTERLY



The Hardy Fern Foundation Quarterly is published quarterly by The Hardy Fern Foundation,
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Articles, photos, fern and gardening questions, letters to the editor, and other contributions are welcomed!

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Karie Hess (inside design)

Fern Foray of the American Fern Society: "Feather River Canyon and Beyond"

Tom A. Ranker, University of Colorado Museum

On Sunday July 29, 2006, Alan Smith of UC-Berkeley led a fern foray for the American Fern Society. He was assisted by graduate students Ruth Kirkpatrick and Andy Murdock. The foray was held in association with the joint annual meeting of the American Fern Society and the Botanical Society of American, along with several other scientific plant societies. Approximately 40 people participated and the weather was nearly perfect, mostly sunny, but not too hot!

From Chico, we departed in a large bus and made our way up the Feather River Canyon on Highway 70. We passed numerous serpentine rock out-crops, with their interesting variety of plants that are especially adapted to growing in the magnesium- and iron-rich soils derived from serpentine. After about 20 miles, we stopped in the Plumas National Forest at nearly 1500 ft. in elevation. We saw a nice variety of ferns at this stop, including *Aspidotis californica*, *Cystopteris fragilis*, *Dryopteris arguta*, *Polystichum imbricans* (with 'imbricated' or venetian-blind like pinnae), and the large and lovely *Woodwardia fimbriata*. One of the common trees in the area was big-leaf maple, *Acer macrophyllum*.

We headed on for another 30 miles up the road to about 1700 feet in elevation and investigated the roadside fern flora. There we discovered *Pellaea mucronata*, *Pentagramma triangularis* ('goldenback fern'), more *Polystichum imbricans*, *Polypodium calirhiza* (which is an interesting hybrid between *P. californicum* and *P. glycyrrhiza*), *Selaginella wallacei*, and more *Woodwardia fimbriata*.

Continuing on for 25 miles to southeast of the town of Quincy, we visited Plumas-Eureka State Park at about 5000 ft. elevation. Just a short 10 minute walk up a beautiful, forested trail we discovered *Equisetum arvense*, *Aspidotis densa*, *Athyrium filix-femina*, *Cheilanthes gracillima*, *Cystopteris fragilis*, *Pellaea mucronata* var. *mucronata*, the especially handsome *Pellaea brachyptera*, *Polystichum imbricans*, and the most common fern in the galaxy: bracken – *Pteridium aquilinum*.

At nearby Lower Sardine Lake, a beautiful subalpine lake flanking the 8500 ft. Sierra Buttes, we explored for species of quillworts, the aquatic lycopod genus *Isoetes*. We were fortunate to have with us one of the world's expert quillwortologists, Dr. W. Carl Taylor of the National Science Foundation. Carl found one species of quillwort in the lake, which he identified as *Isoetes occidentalis*.

We returned to Chico after the sun set after driving nearly 300 miles. All were exhausted but agreed that we had a splendid fern foray with plenty of interesting ferns, beautiful scenery, and good companionship!

Fabulous Ferns

Calendar 2007

*Ferns from the gardens of John and Carol Mickel
Photographs by Karen M. Sharmān*



February

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July

November

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BOOK REVIEW

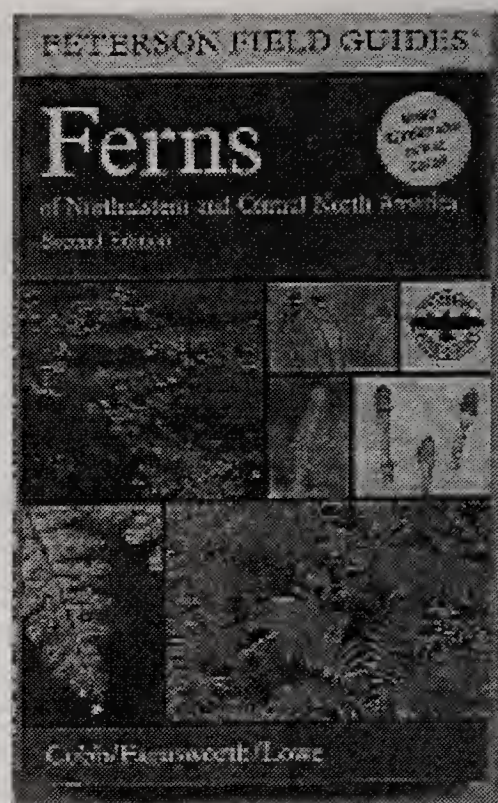
Jack Schieber
Holland, PA

THE PETERSON FIELD GUIDE: "FERNS of Northeastern and Central North America", Second Edition

When I first picked up the new second edition of Peterson's Guide to Ferns, I said to myself, "Look at this, what have we here?" The book is half again as thick as the 1956 edition, it's replete with a bevy of photographs and it's printed entirely on hard, glossy paper which will stand up well in the field. And further, penned or pencilled notes write easily and distinctly in my personal copy. Unfortunately, it doesn't much help the translation of my scribbles.

In the introduction to the new Guide it is noted, "The intent of this Field Guide is to be brief and simple, yet as accurate as possible —". I find that they have done remarkably well in finding the compromise between the simple description helpful to the novice still unfamiliar with technical terms, the brief description helpful to the person in the field wanting to keep up with the rest of the group of ferners, and the detailed technical description for the practiced fern lover who needs nuances and completeness of definition and description. There is now a glossary which lists the important terms specific to ferns and fern relatives (as differentiated from the fern "allies") and the more common descriptive terms such as acuminate, pinnate-pinnatifid and sessile. They have retained both crosier and fiddlehead, the coiled unfurling young fern frond which resembles the end of the arm of a violin or fiddle. Both terms are commonly used. On the other hand, they have gotten rid of the confusing term "rootstock" because of its reference sometimes to the stem as the rhizome and sometimes to the stem as the base of the stipe. And a glossary is necessary. It is most distressing to use the *Flora of North America* for fern descriptions when Volume 2, which lists the ferns, does not include a glossary listing the meaning of descriptive terms, admittedly necessary to precision. I cannot find "acroscopic" in either my Webster's Collegiate or my American Heritage Dictionary so what can I do? Actually, I learned about and use "*Plant Identification Terminology - An Illustrated Glossary*", by Harris & Harris. It's not specific to ferns but it commonly includes drawings of the defined term which often are more helpful than a paragraph of text.

The new Guide has retained the drawings from the earlier edition which were well-done and includes the trademark Peterson diagnostic arrows. Unlike names, plants evolve very slowly so good drawings remain good. Not so with the confusion of common names and the back and forth of taxonomic names. Genomes and chromosomes are great tools for directing scientific classification but the changes play havoc with us fernophiles who are



always striving to remember. All the names in the new Edition are up-to-date so the beginner is at least getting the name as right as it can be at the present time. And we now have additional help in that the new Guide lists both new and old common and botanical names in the heading of each species description and in the index. Thus, for example, the heading is NARROW-LEAVED GLADE FERN (simply GLADE FERN to many of us), then NARROW-LEAVED SPLEENWORT as the old common name, then *Diplazium pycnocarpon*, the new botanical, and finally *Athyrium pycnocarpon* and *Asplenium pycnocarpon*, the old names now called synonyms in the book.

We have long spoken of the ferns and fern allies but advances in the theories of evolution have modified that association. Robbin Moran, in his *A Natural History of Ferns*, has a fascinating essay on the necessary rejugling of families. The Guide in a section, The Relationships of Ferns, refers to changes in the plant kingdom and shows that the leafy ferns are more closely related to the horsetails than to the clubmosses. Another new section, Names of Ferns, refers to the instability of the families and so the Guide has chosen to place more emphasis on the genera and species.

And the Guide is otherwise updated. There are new sections on fern habitats and on conservation. Fifty years ago floral and nursery trades commonly collected from the wild and the fernophile gave little thought to the plucking of a fern from the field to place in the garden. Today, with the encroachments of suburbs and the increases in housing, we too often learn of extirpation and our lists of rare, threatened and endangered species grow longer. But commercial interests still sometimes collect from the wild. The new Guide asks us to question the nursery supplier about their sources. The policy in fern societies today is that we collect nothing but spores from the wild with the only exception being that plants can be taken if they are in a location about to be destroyed by development.

I would like to have seen a repetition or rewrite of the section on how to grow ferns from spores. Although tissue culture is becoming the most common method of propagation by large commercial nurseries, growing from spores remains the practice of suppliers catering to us fern lovers. And it is a pleasant and rewarding process to collect spores and grow them in the home, watching the progression from gametophyte to sporeling to a plant hardened off and large enough to plant outside.

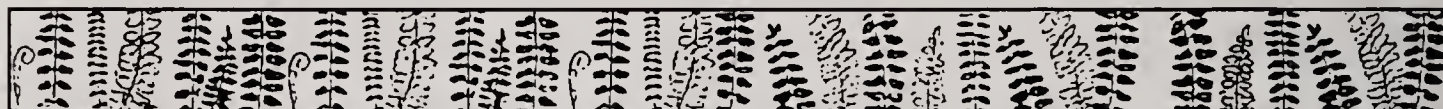
The new edition includes all the species as now recognized and provides morphological distinctions as good as might be hoped for. Unfortunately, or perhaps fortunately, the distinctions are often subtle which is part of what gives the zest to going out into the field to find and identify ferns. I once had the pleasure of watching three experts argue for ten minutes over which of the plants they were seeing was *Dryopteris x triploidea*. Ferns often hybridize to blend the forms of their parents, and species themselves can vary in form according to geographic location. But a map of where a fern occurs, as provided in the *Flora of North America*, is helpful. The Peterson Guide lists only the states and Canadian Provinces of occurrence which is not as easily assimilated. But then the Guide is already as thick as one finds comfortable.

A key as used in botany is the organized way of matching a particular plant we see with where it fits into our classification of plants. It uses a process of elimination going from

Continued on page 88

Book Review *continued from page 87*

characteristics defining broad classifications to those defining a species. A key can be time consuming but it does provide a path of descriptive choices that permit positive identification. The key in this Guide is very helpful in that it provides drawings illustrating each of the descriptive choices, at the genus level as well as for each species. The old Guide used a parallel path starting with divisions based on degree of leaf cut and degree of fern size and coarseness which do not lead easily to systematic classification. The new key begins at the family level with a simplified five parts leading to the genera and then to each species, usually with a full page description. The Guide throughout uses language more familiar to laymen. This and the inclusion of the glossary results in comfortable study. A difficulty with the key is that numbered headings, 1A, 1B, are repeated many times, making it more difficult to quickly find one's way through the pages and to follow the progress of the key. It would seem an improvement to have a continuing series of numbers somewhat as is done in the *Flora of North America*. This Second Edition is the work of Cheryl Lowe and Elizabeth Farnsworth, director of horticulture and senior research ecologist, respectively, at the New England Wild Flower Society, the prestigious organization based in Framingham, Massachusetts. They consulted with and drew upon a wide array of pteridologists and the book reflects this expertise. It is highly recommended to the beginner, the novice and to those more familiar with the ferns and fern relatives.



NEW MEMBERS

Elisabeth Allison
Sharon Banister
Nick Cooper
Roy Farrow
Pat & Phil Gold
Ozzie Johnson
Richard and Laura Kocan
Matthew McCracken
Douglas Megginson
Stephen Ross

Cystopteris tennesseensis - Tennessee Bladder Fern

James Horrocks

Salt Lake City

Cystopteris, which literally means “bladder” referring to the curious inflated bladder-like young indusia, is a name proposed in the early 1800’s. The species *tennesseensis* is a quite desirable small fern which is the fertile hybrid cross between *C. bulbifera* and *C. protrusa*. It can be rather difficult to distinguish from the parent plants but *C. bulbifera* has longer fronds and far more bulbils while *C. protrusa* lacks the bulbils. The North American species of *Cystopteris* are, according to Lellinger, “notable for forming a polyploid complex in which the species have high chromosome numbers and are biologically distinct, but are often difficult to distinguish morphologically.” The Tennessee bladder fern is epipetric on limestone and sandstone, commonly found in moist to wet wooded areas. It frequents cliffs and is found among rocks in low-medium light. It is rather a common native of the eastern and central United States. It is the most common bladder fern in the Ozarks of Arkansas and Missouri. It is disjunct in western Texas. *C. tennesseensis* hybridizes with *C. tenuis* to form *C. x wagneri*.

Description: The rhizome is short-creeping with very congested brown stipe bases. The stipes are nearly equal to the leafy portion of the frond. The deciduous fronds are lanceolate, broadest at the base of the fronds, and acute to acuminate at the apex. At the base and above it is bipinnate-pinnatifid but below the pinnatifid apex it is pinnate-pinnatifid. The fronds are generally more broadly triangular than *C. bulbifera* and also more finely dissected and more foliose. The veins terminate in marginal sinuses which are V-shaped at the apex of a lobe or tooth. As in *C. bulbifera*, there are minute gland-tipped hairs on the rachis and pinnae midribs. Bulbils are found on the underside of the rachis and sometimes on the costae, but they are fewer than in *C. bulbifera*, and smaller, scallier, and less fleshy. The indusia are cup-shaped, truncate at the apex, opening toward the margins, and with scattered, stalked, short white glands. An interesting characteristic of *C. tennesseensis*, not shared by other *Cystopteris* species, is that “nearly all of the leaves, even the smallest, bear sori” (Hoshizaki)

Culture: Even though Lellinger lists it as “not cultivated”, it does respond well in the garden but is rarely available. It is best grown in basic soil that is kept quite damp and is at its best among or under rocks. The light-green fronds are a cheery contrast to the darker greens of other ferns. This species thrives in low-medium light and reproduces readily from the curious bulbils that detach and grow if they find a consistently damp spot. As Mickel says, this is a great garden fern and is well worth a try.

References:

A Field Manual of the Ferns and Fern Allies of the United States and Canada, 1985, David B. Lellinger, Smithsonian Institution Press, Washington D.C.

Fern Grower’s Manual (revised), 2001, Barbara Joe Hoshizaki and Robbin C. Moran, Timber Press, Portland, OR.

Ferns For American Gardens, 1994, John Mickel, Macmillan Publishing Co., New York

Announcing — HFF/BPS Tour of the Southwest — October 2007

Not surprisingly while many members of the HFF and BPS were enjoying their travels in Germany this past summer, the question came up as to “Where next”? Naud Burnett immediately stepped up and suggested that he organize a 2007 excursion in Texas offering the best of gardens, wild sites (especially but not exclusively for xerics) and botanical gardens/arboretums as well as some interesting local sites. The response was enthusiastic and Naud has been working on the details ever since. The following is a tentative itinerary for the proposed trip beginning in early October 2007. The price has not yet been determined, but like most of our tours will be reasonable. Space will be limited so please indicate your interest to Naud by e-mail at naud@naudburnett.com, phone (214) 528-9014, or mail at P.O. Box 41140, Dallas, TX 75241. I look forward to seeing you there!!

Ferns of Southwest - Texas a Land of Diversity from Swamp to Desert.

You will arrive at DFW Airport, which is fifteen miles long and three miles wide. It consists of five terminals and seven runways. It is the largest in size and the fourth largest in volume in the nation. The airport is located between Dallas and Ft. Worth so it would be more practical to stay at a nearby hotel to avoid expensive taxi rides. Hotel pickups are free. There are many daily direct flights from Great Britain, Germany and the Netherlands.

Everyone should arrive on October 2, 2007. The tour will begin early Wednesday, October 3. We will then tour the fern garden of Ruth Dynbort, and then proceed to the sixty six acre Dallas Arboretum and Botanical Garden (which is only twenty five years old). It contains the finest color gardens in the U.S., as well as the Fern Dell Garden. Lunch will be in the garden before proceeding to Casa Flora, the largest fern liner grower in the U.S. Their plants (106 varieties) are grown in four tissue culture laboratories, three of which are in Florida and one in Dallas. In small groups, we will take a brief tour of their laboratories and greenhouses including a greenhouse where their new ferns are being trialed and tested for speed of growth and cold hardiness before a decision is made to produce a variety.

Proceed to Naud and Wim Burnett's home for wine, cocktails, beer and appetizers. We will then enjoy dinner at an authentic Tex-Mex restaurant as guests of Casa Flora.

Dallas hosts the State Fair of Texas during the first two weeks of October, with an attendance of a million and a half visitors. There will be exhibits of pigs and other animals, a Midway with rides, museums, and a musical in the Music Hall. There will also be fun rides, including the world's largest Ferris wheel and the bearded lady on the midway. It's great to sit on the bench and watch the world go by.

October 4, Thursday

We will leave the DFW hotel for the fern garden of Judy Caughlin in nearby Arlington where we will see around 150 species in her woodland garden. Proceed to Fort Worth to B.R.I.T. and a tour of their world-class Horticultural library and Herbarium of

Texas Ferns and Native Plants. Lunch will be at the Kimball Museum, which is located in the Arts District, which includes the Ft. Worth Botanical Garden, which we will be visiting next. Their gardens were started in the 1930's so it has acquired a very mature appearance. The garden also includes a Japanese Garden, a garden of perennials, roses, theme gardens, as well as a large conservatory with many ferns.

We will then have dinner (on your own) at a new 2000 room Gaylord Texan Hotel with all of the rooms looking into large glass-roofed gardens. Too expensive to stay at but nice to visit. I have been forewarned that some of their fifteen restaurants there can be pricey as well. It's a short bus trip from our hotel. It is the Texas version of the original Opryland Hotel in Nashville, Tennessee.

October 5, Friday

Today and tomorrow are considered the most hectic days in Dallas. Not only is the State Fair in progress, but the football game and rivalry between the Texas University and Oklahoma University is taking place at the Cotton Bowl at the State Fair. So we must leave early to avoid the drunken visitors. We will start at Tyler State Park where we will see many native ferns in the pine forests. We will then proceed to the Hot Springs, Arkansas vicinity to see the Galvan Arboretum where Don Crank, a fern enthusiast, will show us 52 fern species in the next tour garden.

The evening meal will be at our resort hotel at De Gray State Park near the Hot Springs.

October 6, Saturday

Don Crank will lead us to the Ouachita (wash a tah) National Park including Meyers Creek where we will see twenty six genus/species of ferns. We will be wandering over hills and dells with accompanying creeks and swamps where native stands of Dixie Wood fern, Marsh fern, other ferns and fern allies are abundant. Don urges us to have waders, waterproof shoes, or an extra pair of washable shoes. This is an all day event and we will have lunch in the forest.

Dinner will be at the resort where we will have a slideshow for participants who would like to bring slides.

October 7, Sunday

Leave for Nacogdoches (pronounced nak, ugh, doe, chez. It is an Indian word). We will take a scenic road through a pine forest. We will stop briefly at Caddo Lake, which was created by an earthquake in Madrid, Missouri in the late 1800's. There we will see primeval forest, swamp lake with Cypress trees festooned with Spanish Moss from their limbs and cypress knee growths projecting above water level. There should be native ferns nearby. It's a really weird and spooky place. We will then proceed to Nacogdoches to the Mast Botanical Gardens at Stephen F Austin University. Roger Hughes will be our host. We will then proceed to an experimental forest with pavement for a pleasant walk in a pine and oak forest where native ferns are plentiful.

Continued on page 92

HFF/BPS Tour *continued from page 91*

Dinner will be on your own. Hotel not yet selected.

October 8, Monday

The agenda for this day is not yet decided. An option is to drive to Houston, stopping at a native nursery and Big Thicket National Forest (the last virgin forest left in Texas). We should see many ferns. We are attempting to see a tropical fern collector before visiting the Mercer Arboretum in the area of north Houston (a large and growing city). We will more than likely spend the night somewhere in a Houston suburb.

October 9, Tuesday

On our drive to Austin the (Capital of Texas) we may stop by a small botanical garden specializing in Mexican natives before visiting Zilker Botanical Garden in Austin, which has a newly installed fern garden. It has large ground covers of *Marsilea*. We will proceed to the hotel, which overlooks the major bridge on Town Lake. The underside of the bridge is home to a million and a half Mexican bats. It is quite a spectacle to see a cloud of bats fly out at dusk for a night of eating insects.

October 10, Wednesday

We are planning a short trip to see ferns in native habits. Arrangements are being made to tour a few private gardens and end up at another garden for cocktails and walking a few blocks to the home of Staghorn enthusiast Laura Joseph for dinner in her garden.

October 11, Thursday

We will take a short drive to San Antonio where we will visit the San Antonio Botanical Garden and perhaps some native fern sites as well as the Riverwalk near the Alamo and Riverwalk. There are many restaurants along the Riverwalk or you may want to take a riverboat, which cruises the winding river through the heart of the city. San Antonio is a major U.S.A. tourist attraction.

October 12, Friday

We must leave early to depart for the Enchanted Rock Mountain which is a broad granite dome that can be climbed and often see small pools with *Marsilea*. It is a bit out of our way but well worth it. We will proceed on the second longest journey of the trip to Big Bend National Park in area called the Trans-Pecos, which is part of the Chihuahua Desert. We will spend the night at the Marathon Texas or the Chisos Mountain Lodge, which is at an elevation 8,000 ft and can be quite cool even when it is hot in the desert below. You will marvel at the next two days when you see the xerophytic ferns that survive in an area with 8" of rain. Quite often there are summer and fall rains in the mountains and ferns quickly resume growth after being dormant. We will have tours to the native sites of abundant ferns by naturalist Petei Zelazny. You will be given a book on of the Trans-Pecos, which she was involved in creating.

October 13, Saturday and October 14, Sunday

Petei will take us to Cat Tail Falls, Girl Scout Camp and to the Fort Davis area in the Davis Mountains that can get up to 20" of rain (mainly in the summer) so there is an abundance of ferns. The desert wild flowers can be wonderful after rainy spells. Also to be seen are the herbarium in Alpine of Sul Ross University, native plant nursery Marfa lights (mysterious, darting lights visible to Indians before European settlers) Fort Davis and McDonald observatory for those who would like to see the outer space University of Texas facility. "The stars at night are big and bright, deep in the heart of Texas."

While this part of Texas is in what some may consider "God forsaken" country, we hope you will find it fascinating and so peaceful, you will want to come back.

October 15 Monday

This will be the longest part of the tour on our return to DFW, and with a short stop at Monahan Sand Dunes State Park. Giant sand dunes make you feel like you're in the Sahara.

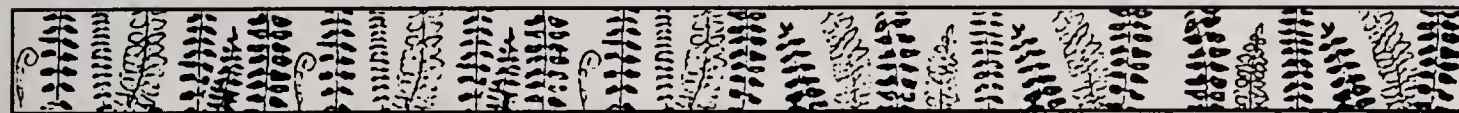
After visiting the Sand Dunes, we will return to the hotel at DFW for our farewell dinner. Most participants will probably return to your homes on Oct. 16. Any of you who wish to stay an extra few days are welcome to stay with Wim and Naud. (A maximum of four people).

Texas geological records began over a billion years ago when it was covered by the ocean and sediments built up over the ages and with many uplifts about three hundred million years ago. The Ouachita Mountains rose from Big Bend to Arkansas. These mountains blocked sediment and created the ingredients for the vast West Texas oil fields. These mountains are now covered with sediment and rock and until about 2 to 66 million years ago were covered with sediments 50,000 ft. under the Gulf Coast plain. The Davis Mountains and Chisos Mountains with many peaks, in Big Bend, were created by volcanoes, which we see today.

While making our journey across Texas we will call your attention to the features formed by the uplifts, formations and the locations where the dinosaurs were abundant and their foot prints can be seen in many dry riverbeds and limestone rock.

About 2 million to 10 million years ago, the Ice Age ended and its ice melted, the sea level rose, and bays and estuaries were formed. The rivers brought more sand to form beaches and barrier islands.

Source: Roadside Geology of Texas



HFF/BPS "Gems of Germany" Tour

June/July 2007

Sue Olsen

The fern gardens in Germany are among the best if not **the** best in the world. Having viewed their wonders and visited with their knowledgeable owners in 1997, (and again in 2004), I was anxious to support a comprehensive tour there and was extremely pleased when Pat Acock, Meetings Secretary of the BPS agreed and Dr. Berndt Peters of Süderbrarup in Northern Germany took on the responsibility of organizing such a tour. Dr. Peters' itinerary was outstanding - offering a pleasant balance of visits to private gardens, wild sites and tours of the interesting cities and towns where we stayed along the way. His attention to detail, calm demeanor and ready supply of helpful information enhanced the experience well beyond the expectations of the participants and we all extend our sincere thanks. Vielen Dank Berndt!

Sue Olsen

Part I - Tour Prologue

Pat Acock

We all arrived in Hamburg at various times during 29 June and many ad hoc groups materialised and these descended on the Hamburg Botanical Gardens (Planten un Blomen). The gardens did not seem to have many ferns in the outside part although a few common ones and a few cultivars were noted. However the glasshouses turned out to be a total delight. The houses were entered through a veranda of Cacti. Inside the entrance were many tropical plants and attached to a few were epiphytes such as *Rumohra adiantiformis* and *Nephrolepis* sp. Further back was a Cycad house with a *Welwitschia mirabilis*. From here there was a house that started with Macronesian plants and merged into Australasian ones. Scattered around were ferns of the regions including *Adiantum reniforme*, *Diplazium caudatum* and surprisingly, having spored itself probably from a deceased plant, *Dryopteris aitoniana* in a wall. Towards the end of the house was a mix of interesting ferns amongst *Cyathea cooperi* and *Dicksonia antarctica*, including *Cibotium schiedei*.

But the very best was to come for when we went into the final house there was a whole host of ferns in an area dedicated to them. It was highly humid, with well-weathered trunks and a wall dripping with the most exotic of epiphytes all growing with consummate ease in what must have been carefully planned niches. There were adiantums, polypods, davallias, elaphoglossums and nephrolepis on the trunks and walls and *Adiantum trapeziforme*, diplaziums and host of exotic plants on the ground. Most spectacular of all

was an *Elaphoglossum crinitum* of spectacular proportions and with a fertile frond growing on the ground. I had only ever seen a few before and these were at the highest point in the Elfin Forest in Trinidad. This glass-house was one of the best fern houses I have ever visited and certainly the most unique with its most natural and well grown epiphytes only probably bettered by Bert Bruty's Fern House at Kew.

Germany 2006 Report

Day 1, 30th June – Schleswig and Süderbrarup

Martin Rickard

In the morning our tour leader, Berndt Peters, organised a tour of the old town and cathedral in Schleswig, a very attractive small city in the north of Germany, not far from Denmark. After enjoying the sights and a lunch by a lake, a short coach trip brought us to Süderbrarup to begin enthusiastic ferning at the home of our tour leader.

Berndt has lived here with his parents for many years and the garden has developed into one of the very best collections of hardy ferns in the world. The entrance, by a side gate, is modest but very soon interesting ferns appear. In a shady spot by a greenhouse was a selection of *Dryopteris* cultivars along with a beautiful colony of *Gymnocarpium oyamense*. On the other side of the greenhouse, in sun, was an interesting collection of xerophytic ferns growing on a raised, gravelly bank. These included *Cheilanthes fendleri*, *C. tomentosa*, *C. marantae* and *C. lanosa*, with *Pellaea atropurpurea* and *Asplenium cuneifolium* thrown in for good measure.

Moving on ferns were everywhere in huge variety including *Pseudophegopteris levingei*, *Dennstaedtia davallioides* and a truly magnificent form of *Osmunda regalis* Decomposita Group raised by Berndt from spores. This plant is truly tripinnate and the best of its kind I have ever seen. In appearance it is a plumose *O. regalis* although it produces fertile spore.

Initially Berndt walked around the garden to give us a general introduction to the layout, ending up at a rock garden. This is made of large rocks imported from a long distance as there is no suitable rock in northern Germany. Ferns here were astonishing and included *Woodsia subcordata*, *W. fragilis*, *W. ilvensis*, *W. ilvensis* x *W. alpina*, *W. polystichoides*, *Asplenium incisum*, various *Asplenium* hybrids, *Dryopteris fragrans* and *Polystichum lachenense*. Nearby were *Blechnum niponicum* and a selection of Chilean ferns. Elsewhere scattered about the following particularly caught my attention. *Osmunda lancea*, *O. japonica*, *Adiantum aleuticum* 'Laciniatum', *Polystichum setiferum* 'Vivien Green', *P. setiferum* 'Grandiceps Jones', *P. setiferum* Hironnelle Group, *P. setiferum* 'Foliosum Walton', *P. setiferum* 'Smith's Cruciate' and some fascinating progeny from it. The series of hybrid polystichums raised by Anne Sleep at Leeds many years ago were well represented. Most notably, *Polystichum x dycei* - a truly magnificent fern. Berndt's collection of polypodiums is comprehensive but sadly few were up at the time of our visit. His *Athyrium* cultivars included wonderful plumosums and the aposporous 'Clarissima'. Berndt lists 425 different species, subspecies and hybrids but his list does not include cultivars. If

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added the total must be very close to the 682 taxa grown by Christian Kohout - which does include cultivars. The garden is a garden - not just a collection of ferns. It is well laid out in light woodland with interesting features including a stream, stumpery and of course the rockery. At any time during our visit members of the party were welcome to wander into the cool of Berndt's house where his parents provided copious amounts of much needed tea and a wonderful range of delicious cakes. Our time here was all too short as we had to move off for an excellent welcome dinner back in Schleswig but this was a truly magnificent way to start the tour.

Day 2, 1st July - Sievershütten and Ellerhoop Arboretum

Robert Sykes

Saturday opened after an excellent breakfast and the daily bus ride with a visit to the remarkable garden of Wolfram Gassner at Sievershütten. When he came 10 years ago the present garden was a field. It must have been a challenging site. A broad strip of about 2 acres of flat ground lies between the road and a marsh, which is left wild as a nature reserve. This is the coldest part of Northern Germany. The hardiness zone is 6/7. Last winter the temperature fell to -23°C (-9°F). Slugs and moles are a major problem.

Wolfram is a professional garden designer. He brought in a digger to raise a high bank to shelter the garden from the sight and sound of road traffic, and to excavate a pond and other features. The farther, wilder part of the garden is separated by a mole defence of mesh link fence over sunken concrete. There are already some fine trees, silver willows in particular having grown well in the last 10 years. Grass tracks are kept mown between wild vegetation, and some mature clumps of bamboo.

An unusual feature of the main garden is a rockery, shade-covered and totally protected from slugs by an encircling moat. This allows him to grow a number of slug-vulnerable species such as *Dennstaedtia wilfordii* and *Camptosorus rhizophyllus*.

Unlike Berndt Peters' garden there are only a few fern cultivars, notably an attractive *Adiantum pedatum* with recurved pinnules, a sport in a tray of sporelings. But in fern terms, this is dominantly a species garden with a huge range, growing in carefully selected niches in 'plant communities' (his expression) among shrubs, ground covers and herbaceous plantings; woodsia, cheilanthes and *Aspidotis densa* in rocky cracks within the moat, *Arachniodes standishii*, *Osmunda lancea* and *O. spectabilis* in dappled shade, and *Hypolepis millefolium*, surprisingly, in full sun...and hundreds more. As Jack Schieber remarked, "I keep having to remind myself I don't have to know what they are all called – I can just enjoy them."

A few of us went down to Wolfram's propagation room in the cellar. Many small plastic pans of spores and gametophytes, with larger trays of young sporelings coming on, are all carefully numbered and recorded. *Trichomanes speciosum* and other filmy ferns grew in fish tanks.

The garden is a work in progress – the current project is a conservatory, which will house, not ferns, but cycads, at present squatting in the living room.

Our thanks to Wolfram and Irene for their hospitality and the refreshments they generously provided.

Our next call at the Ellerhoop Arboretum was very different. It is more like a garden than an arboretum, though there are some lovely trees, and an extensive annual planting. It is open to the public and was well patronised this sunny summer Saturday. The main fern interest is massed *Osmunda* at the foot of the lake (almost hiding a dinosaur calf). *O. regalis* was clear enough; *O. gracilis* was smaller; was the larger fern with *gracilis* type fertile fronds a hybrid? There were also some of the *purpurascens* form and *O. claytoniana*.

Keen spirits enjoyed a conducted evening tour of Lübeck: others preferred to watch England being knocked out of the World Cup.

Day 3, 2nd July – Eutin, Glinde and Bremen

Graham Ackers

Continuing the initial tour phase of northern German towns, in the morning we arrived at Eutin, and the garden of Dietrich and Sabine Nittritz. The garden is “L” shaped, part along the side of the house, and part in the rear, the whole being about one third of an acre, more manageable in my terms following some of the garden “estates” visited earlier! Surrounding the garden were many mature trees, mainly conifers providing shade appropriate for fern growing, and creating a classic woodland garden. The rear was particularly shaded, being dominated centrally by a large 35 year old specimen of *Sequoiadendron giganteum*. As well as providing welcome shade, the tree served to dry the soil, so necessitating frequent watering. As to be expected, there were many fern taxa in the garden - well over 100 according to Berndt’s list. Notable were the range of *Polystichum setiferum* cultivars and a number of the artificial *Polystichum* hybrid taxa of Anne Sleep. The side part of the garden included a lawn within the design, and was slightly less shaded than the rear. Throughout, carefully selected accompanying woodland plants included *Tiarella cordifolia* as ground cover, Rhododendrons, Arisaemas, Polygonatums, Hostas and Cyclamen (one of Sabine’s particular interests). Welcome refreshments on the sunny patio completed the visit.

Our afternoon visit took us to the small town of Glinde and the garden of Helmuth Schmick and his family. This was another ‘relatively’ small garden with a most interesting and effective layout, being long and fairly narrow, sloping away from the house. The dominant feature was a most attractive artificial stream meandering along the length of the garden, ending in a very large spring fed pond. Surrounding this were some fine fern stands, including *Matteuccia orientalis* and various *osmundas*, with bogbean (*Menyanthes trifoliata*) decorating the pond surface. Of the approximately 130 fern taxa on Berndt’s list, particularly noted were *Athyrium filix-femina* ‘Minutissimum’, a fine bright green clump of *A. yokoscense*, a lovely ‘un-named’ plumose volunteer *A. filix-femina*, a beautiful *Polystichum setiferum* ‘Green Lace’, a large *Dryopteris crassirhizoma*, *D. yigongensis* (new to me), and *D. monticola* in the small front garden area. Although bordered by conifers, the garden was a little too sunny for some of the ferns as a result of the removal of some large conifers in the neighbour’s garden. In 1990, Helmuth wrote and published

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privately his handsome quarto book “Farne in Natur und Garten”, which some members of the party purchased. Also for sale were fern and gardening books from his library. The family produced substantial quantities of sumptuous vitals, which we consumed around various tables in the garden.

Following a coach journey of about 2 hours, we arrived at our Bremen hotel for a two-night stay with some unpacking of suitcases being possible! The smallish centre of this famous city is most scenic, and our early evening tour centred on the Market Square with many attractive buildings, the most spectacular of which are the Town Hall (Rathaus) and St. Petri Cathedral.

Day 4, 3rd July – Ottersberg and Stuhr

Pamela Weil

Day Four was another clear, bright, hot day — also a distinctive day in that we visited both the largest and smallest private gardens on the tour. Christian Gutschow’s garden in Ottersberg is over 6 acres. Ingo Carstensen’s garden in Stuhr is about a quarter of an acre.

The Gutschow’s garden is an enchanting maze of meandering paths among naturalistic plantings of ferns, rhododendrons and hollies. It is an acid garden with a pH of about 4. The soil is a mix of sand and peat moss.

I counted 235 fern species and hybrids on the Gutschow plant list. Rhododendrons grow well here, too. There are about 300 species and 300 hybrids, most purchased from Peter Cox in Scotland.

Because of his sandy, peaty soil, Gutschow finds some polystichums “a bit difficult to grow”. He solves the problem by burying a 20 litre bucket in the ground about 20 to 30 cm below the plant. This allows plant roots to grow into and be nourished by the improved soil mixture in the bucket.

Here is Gutschow’s recipe for the bucket mix: sand, peat, normal earth (he has to bring this in), and a handful of pebbles. There are stones in the bucket bottom but there is no drainage hole.

There are about 30 buried buckets in the garden. In addition to some polystichums, they are sited under other plants including a 6-foot-high *Dryopteris wallichiana* and some alpine rhododendrons.

Although all of our garden hosts were glad to see us, our afternoon host Ingo Carstensen was one of the most enthusiastic and welcoming. The Carstensen garden is small but rich in habitats — with woodland, rock garden and pond. Tour participant Richie Steffen particularly enjoyed the rock garden, “His *Pellaea atropurpurea* was very nice. And I liked its companion plantings of dwarf vacciniums and gaultherias.”

The rock garden also contains *Cheilanthes argentea*. Carstensen finds this plant easy to grow from spores, but more difficult to keep alive. It does not like to be wet in winter.

I was thrilled to see *Lygodium palmatum* (Hartford fern) for the first time.

When we commented on the damage-free hosta leaves, Carstensen shared his secret. He uses blue professional grade slug pellets. There are brown professional pellets, but he says that they don't last as long. He scatters the blue pellets in the garden early in the year. Just one application is enough to keep the slugs away.

Such was another fine full day spent ferning and learning while enjoying each other's company, finished by a meal in a restaurant in the quaint narrow streets of Bremen's Schnoor district.

Day 5, 4th July – Hannover

Sue Olsen

Warm sunshine and pastoral scenery greeted us as we left Bremen for Hannover and the fern garden and nursery of Mr. Günter Stobbe. It was the only fern stop scheduled for the day and was also the fourth of July, a US holiday that we were most content to celebrate with sprays of fern foliage rather than bursts of fireworks.

Mr. Stobbe purchased his property of some 7,000 square meters in 1968 at which time it was a farm. In 1972 his hopes of turning it into a nursery were compromised by a lack of water - a problem that continues to this day. In the early 1990's after trying roses, cut flowers and perennials, fern specialists including his mentor, Professor Richard Maatsch encouraged him to try ferns. The rest is history. To meet the watering challenge he covers the garden with a hefty mulch of leaves and litter, which he renews annually. This is springy underfoot and a true testament to the value of a good mulch for winter protection as well as water conservation. For the seriously thirsty ferns i.e. osmundas, he buries plastic under the planting site.

The garden is arranged systematically with groupings of one genus per area plus further refinements with one species per bed surrounded by its cultivars, a *Dryopteris dilatata* grouping, for example. His collection also contains some interesting individual specimens such as a super sized *Athyrium filix-femina* 'Frizelliae' and a dwarf *Athyrium filix-femina* 'Victoriae'.

Mr. Stobbe displays in garden shows throughout Germany and has an impressive collection of gold medals and awards for his plants as well as his landscapes. His son creates wrought iron sculptures such as a stylised set of crosiers that accompany and enhance the exhibits.

We were lured away from the garden by dual gourmet treats – refreshments for the hungry and thirsty and plants for sale for those with a different appetite. The endless rows of plant stock are kept moist in non-draining flats with water in the bottom and include many a treasure some of which are now residing in the UK.

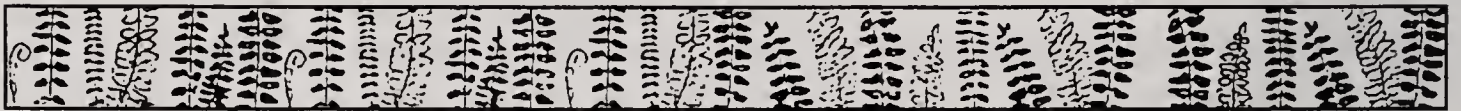
Our travels continued towards Dresden through corn, wheat and potato fields as well as the forests of graceful power generating-windmills slowly turning with a steady and quiet swoosh. We picnicked at Marienborn, an historical site that was once a border crossing

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between East and West Germany and remains today as a grim reminder of those difficult times.

After enjoying a buffet dinner we were entertained by two slide shows. Jennifer Ide presented a detailed program based on her research and interest in furniture created in the mid to late 1800's by Auckland, New Zealand cabinet makers Anton Seuffert and his son William. The exquisite pieces feature inlaid ferns accurately representing New Zealand native species. Judith Jones followed with an interesting series of slides as a tribute to and in memory of her special times with the late Jimmy Dyce. All and all it was a good evening's entertainment.



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